REMARKS

Claims 1 and 3-35 are pending in the present application. In the office action mailed June 16, 2003 ("the Office Action"), claims 1, 3, 10, 20, 21, 25-28, and 33 were rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,230,039 to Grossman *et al.* ("the Grossman patent"). Claims 4-9, 11-19, 22-24, 29-32, 34, and 35 were rejected under 35 U.S.C. 103(a) as being unpatentable over the Grossman patent, and what appears to be, in view of U.S. Patent No. 6,366,290 to Dye *et al.* ("the Dye patent").

As discussed in the telephonic interview with Examiners Brier and Wang on September 9, 2003, Applicant is submitting a more detailed discussion of the patentability of the pending claims with reference to the Grossman patent. An interview summary of the September 9, 2003 interview has been filed concurrently with the present response.

In the Office Action, the Examiner further indicated that the Applicant's previously filed remarks were unpersuasive because the Grossman patent teaches "a method for texture mapping including manipulating pixel coordinates and handling out-of-range texture coordinates in a graphics processor," and consequently, anticipates the combination of elements recited by claim 1. Applicant disagrees with the Examiner's characterization and assessment of the teachings of the Grossman patent, and consequently, disagrees that claims 1, 3, 10, 20, 21, 25-28, and 33 are anticipated by the Grossman patent. The Grossman patent, when read in detail and understood, clearly fail to describe several elements recited in the claims rejected under 35 U.S.C. 102(a).

Texture coordinates 301, as shown in Figure 3a, are processed by the span processors 120. Once processing of the texture coordinate has been completed by the span processor 120, an output coordinate 311, as shown in Figure 3b, is passed to an image engine 121 for texture application. *See* col. 9, lines 10-59 and Figures 3a and 3b. The span processor is equipped with three modes of handling pixels having coordinates outside the range of a texture map: (1) a repeat mode; (2) a clamping mode; and (3) a select mode. *See* col. 9, line 60-col. 10, line 27. Operation of the span processors 120 is described with respect to Figures 5a and 5b of the Grossman patent. As the process of determining a texture coordinate is explained, it will become apparent that the process described in the Grossman patent does not teach the claimed invention.

As shown in Figure 5a, steps 501-505 are performed to determine whether input pixel coordinates are within a range of texture coordinates where texturing is enabled. Masking and comparing are performed at steps 501-504, and the determination of whether the input coordinates are in the range for texturing is made at step 505. If not in the range, a kill bit is set in the output texture coordinate at step 509 and the resulting coordinate is sent to the image engine for further processing. Since the kill bit is set, the image engine will not perform texturing operations. In contrast, if at step 505 it is determined that the input coordinate is within an enabled range of texture coordinates, it is then determined at steps 506 and 507 whether the input coordinate is within the normal coordinate range of the enabled texture map. If the input coordinate is within the normal coordinate range, that is step 511, the input coordinate is sent to the image engine for texture processing. However, if it is determined at step 507 that the input coordinate is outside of the normal coordinate range, that is step 512, then the span processor must then determine what texture coordinate to send to the image engine.

A clamping operation, which, as previously discussed, is one of the modes available in the span processors 120 for handling texture coordinates outside of the normal coordinate range, is described in Figure 5b. At a step 520 the sign bit of the input coordinate is used to determine whether the input coordinate is beyond the positive range of the texture map (i.e., step 523), or whether the input coordinate is beyond the zero range of the texture map (i.e., step 525). If at step 520 it is determined that the sign bit is "0", indicating that the value is positive and the input coordinate is beyond the positive range of the texture map, the texture coordinate is set to the most positive address value for the texture map (i.e., at step 524) in order to clamp the texture value to the value at the positive border of the texture map. In contrast, if at step 520 it is determined that the sign bit is "1", indicating that the value is negative and the input coordinate is beyond the zero range of the texture map, the texture coordinate is set to the least positive address value for the texture map (i.e., at step 521) in order to clamp the texture value to the value at the zero border of the texture map. The resulting texture coordinate, either 0000 or FFFF, is then provided to the image engine at step 522.

As the previous explanation of the operation of the span processors 120 illustrates, the process of calculating a value for the output texture coordinate is conditional. That is, calculation of the output texture coordinate occurs only after various decisions are made. Calculation of any values other than the value ultimately output by the span processor as the

output texture coordinate does not occur because the decision process in arriving at what value to calculate is linear. For example, in one case, calculation of a texture coordinate for an input coordinate does not occur until after (1) it is determined that the input coordinate is within an enabled range of a texture map (i.e., steps 501-505), (2) it is determined that the input coordinate is beyond the normal coordinate range of the enabled texture map (i.e., step 507), and (3) it is determined that the input coordinate is beyond the positive range of the texture map (i.e., step 520-524). Finally, after three judgments are made to determine that the input coordinate is located in an enabled range for texturing and that the input coordinate is beyond the positive range of the texture map, namely, steps 505, 507, and 520, an output texture coordinate is calculated and provided to the image engine.

In contrast, in various embodiments of the present invention, texture coordinate values for a *plurality* of input coordinate ranges are calculated *concurrently*. That is, these values are calculated *a priori* the actual determination of what the output texture coordinate will be. The output texture coordinate is then selected from the plurality of texture coordinate values based on (1) the sign of the input coordinate value *and* (2) the signs of the plurality of texture coordinate values calculated. Thus, unlike the teachings of the Grossman patent, multiple values are calculated at the same time, and then one of those values (or the input coordinate value itself) is selected to be provided as the output texture coordinate. As previously discussed, the process described in the Grossman patent calculates an output texture coordinate only after making several determinations about whether the input coordinate is in an enabled texture mapping range, if so, then whether the input coordinate is in the normal coordinate range of the texture map, and if not in the normal coordinate range, then whether the input coordinate is beyond the positive range of the normal texture coordinate range or whether the input coordinate is beyond the zero range of the normal texture coordinate range. Finally, after going through this determination process, an output texture coordinate is calculated and provided to the image engine. Generally speaking, no other (i.e., alternative) values for the output texture coordinate are calculated by the span processor during the decision process.

Looking specifically at claim 1, the Grossman patent fails to describe several limitations of the combination of limitations recited by claim 1. For example, a texture coordinate value is not calculated for *each* of the predefined input ranges. As previously discussed, the Grossman patent first determines where the input coordinate is relative to the

texture map and *then* calculates an output texture coordinate value. Moreover, the Grossman patent fails to describe selecting from the plurality of texture coordinate values. The reason is simple: the Grossman patent does not calculate any potential output values other than the value that will be output to the image engine, and consequently, there is no need to make a selection of an output value. Even if it could be argued, as the Examiner has, that a "selection" is made, the selection described in the Grossman patent is not based on (1) the sign of the input texture coordinate value *and* (2) the signs of the calculated texture coordinate values. Although the Examiner asserts that the sign bit 308 is analogous, *see* the Office Action at p. 17, the sign bit 308 is only for the input coordinate word 301. The Grossman patent fails to discuss any sign bits for any other coordinate values.

Turning the Examiner's particular comments, in addition to the Examiner's mischaracterization of the Grossman patent, other assertions by the Examiner actually support the differences previously discussed between the Grossman patent and claimed embodiments of the present invention.

For example, in the Office Action at page 17, the Examiner asserts that the Grossman patent teaches determining if an input coordinate is within a selected range, and that "texture coordinate values can be then calculated based on the sign and the range of the texture coordinate values." *See* the Office Action on p. 17. As indicated by the Examiner's remarks, the specific range in which the input coordinate is located is *first* determined, and *then* the texture coordinate value can be calculated. With specific reference to claim 1, a texture coordinate value is calculated for *each* of the input ranges, and not merely for the input range in which the input coordinate is located, as described in the Grossman patent. The Examiner further asserts that in the process of calculating/determining the texture coordinates, the Grossman patent teaches that "[w]hen texture coordinate values are determined within the texture map range, input texture coordinate values are used for texturing. When coordinate values are determined to be out of the texture map range, certain calculated texture coordinate values are used for texturing based on the sign on the texture coordinate values." *See id.* As shown by the Examiner's own understanding of the Grossman patent, only *after* the determination is made whether the texture coordinate values are within the texture map range are the input texture coordinate values are used for texturing. Moreover, only *after* it is determined that the coordinate values are out of the texture map range are texture coordinate values calculated based on the sign of the texture

coordinate values. In contrast to the Grossman patent, as asserted by the Examiner, claim 1 specifically recites that a texture coordinate is calculated for each of the input ranges, and one of the calculated values is selected to be provided as the output texture coordinate. Selection, as recited in claim 1, is based on the sign of the input texture coordinate values *and* the signs of the calculated texture coordinate values. Thus, rather than proceeding through the decision process as shown in Figures 5a and 5b of the Grossman patent before calculating an output texture coordinate, the embodiment of claim 1 calculates multiple potential values for the output texture coordinate, and one of those potential values is then selected.

As with claim 1, claims 10 and 21 also recite calculating a plurality of texture coordinate values and then selecting one of the calculated values to be provided as the output texture coordinate based on the sign of the input texture coordinate and the signs of the calculated texture coordinate values. Similarly, claim 26 recites a plurality of calculation circuits for calculating a respective texture coordinate value, and further recites a selection circuit and select logic for choosing one of the calculated texture coordinate values to be provided as the output texture coordinate value based on the sign of the input coordinate and the signs of the respective texture coordinate values. As previously discussed, the method and span processor described in the Grossman patent does not teach at least these limitations. The Grossman process of providing an output texture coordinate results from a linear decision making process which then leads to calculating the output texture coordinate value. Multiple potential values are not calculated, and consequently, there is not a process of selecting which of the potential coordinate values is to be provided as the output texture coordinate.

As previously mentioned, claims 4-9, 11-19, 22-24, 29-32, 34, and 35 were rejected under 35 U.S.C. 103(a) as being unpatentable over the Grossman patent in view of the Dye patent. The Dye patent has been cited by the Examiner as teaching "the specific formula for calculating the texture coordinates and the specific way of selecting the corresponding texture coordinates." *See* the Office Action at p. 8. The material in the Dye patent that has been cited by the Examiner has been reviewed, however, the specific process of calculating the texture coordinates recited in many of the dependent claims is not found. For example, claim 4 recites a particular manner in which the texture coordinates are calculated. The Dye patent does not appear to describe a method that is the same as that recited in claim 4. If the Examiner maintains the rejection of any of the dependent claims directed to calculating the texture coordinates,

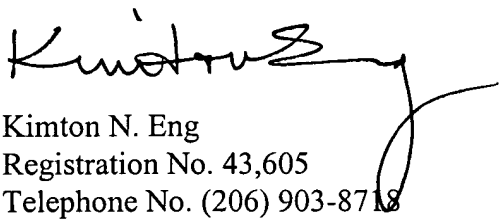
Applicant requests that the Examiner provide a more specific reference to the material in the Dye patent that discloses such limitations.

Moreover, claims 3-9, which depend from claim 1, claims 11-20, which depend from claim 10, claims 22-25, which depend from claim 21, and claims 27-35, which depend from claim 26, are patentably distinct from the Grossman patent, and patentable over the Grossman patent in view of the Dye patent, based on their dependency from a respective allowable base claim. That is, each of the dependent claims further narrows the scope of the claim from which it depends, and consequently, if a claim is dependent from an allowable base claim, the dependent claim is also allowable. However, because each claim in an application represents a different invention, the rejection of an independent claim does not necessarily result in the rejection of claims depending therefrom. For the foregoing reasons, the rejection of claims 3-9, 11-20, 22-25, and 27-35 under 35 U.S.C. 102(a) or 103(a) should be withdrawn.

All of the claims pending in the application are in condition for allowance. Favorable consideration and a Notice of Allowance are earnestly solicited.

Respectfully submitted,

DORSEY & WHITNEY LLP



Kimton N. Eng
Registration No. 43,605
Telephone No. (206) 903-8718

KNE:asw

Enclosures:

Postcard
Fee Transmittal Sheet (+ copy)
Applicant's Statement of Interview Substance under 37 C.F.R. § 1.133(b)

DORSEY & WHITNEY LLP
1420 Fifth Avenue, Suite 3400
Seattle, Washington 98101-4010
(206) 903-8800 (telephone)
(206) 903-8820 (fax)

h:\ip\documents\clients\rendition\500845.01\500845.01 amendment after final.doc

PATENT

I hereby certify that on the date specified below, this correspondence is being deposited with the United States Postal Service as first-class mail in an envelope addressed to Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

September 9, 2003
Date

Ayesha S. Wilks

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	: 09/715,428	Confirmation No.	: 7717
Applicant	: Ole Bentz	Attorney Docket No.	: 500845.01
Filed	: November 15, 2000	Customer No.	: 27,076
Art Unit	: 2672		
Examiner	: Jin-Cheng Wang		
Title	: TEXTURE ADDRESSING CIRCUIT AND METHOD		

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPLICANT'S STATEMENT OF INTERVIEW SUBSTANCE UNDER 37 CFR § 1.133(b)

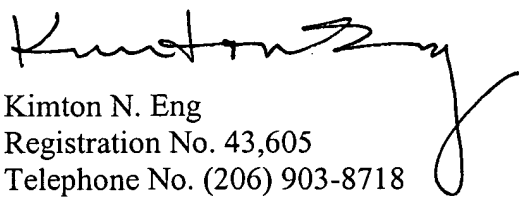
Sir:

A telephonic interview between Applicant's representative, and Examiners Brier and Wang took place on September 9, 2003. The distinctions between U.S. Patent No. 5,230,039 to Grossman et al. ("the Grossman patent"), and the pending claims, with specific reference to claim 1, were discussed. Following the discussion, it was agreed that a formal response providing a more detailed discussion of the differences between the Grossman patent and the pending claims would be filed by Applicant.

Applicant requests that the Examiner review the Applicant's statement, and if acceptable, make the statement of record in the subject application. Should the Examiner consider this statement incomplete or inaccurate, Applicant requests that the Examiner point out any inaccuracies or areas lacking completeness.

Respectfully submitted,

DORSEY & WHITNEY LLP



Kimton N. Eng
Registration No. 43,605
Telephone No. (206) 903-8718

KNE:asw

Enclosure:
Postcard

DORSEY & WHITNEY LLP
1420 Fifth Avenue, Suite 3400
Seattle, WA 98101-4010
(206) 903-8800 (telephone)
(206) 903-8820 (fax)

EXAMINER	DATE ACCEPTED
* EXAMINER: Initial if summary has been accepted and made of record in the application in accordance with MPEP § 713.04. Include copy of this form with next communication to applicant(s).	

h:\ip\documents\clients\rendition\500845.01\500845.01 interview summary.doc